

**WE CLAIM:**

1. An implantable stent comprising:  
a tubular member having an interior surface and an exterior surface, characterized in  
that  
5 at least one of said surfaces is hydrophobic, and  
a region of said at least one surface includes an array of microstructures or  
nanostructures that covers first portions of said surface, said array causing the region to have a  
dynamically controllable hydrophobicity.

10 2. The stent of claim 1, further including a control device affixed to said tubular  
member for varying said hydrophobicity.

3. The stent of claim 2, wherein said control device comprises an electronic  
device or an optical device.

15 4. The stent of claim 3, wherein said control device is remotely actuatable from an  
external source.

20 5. The stent of claim 1, wherein said array leaves second portions of said surface  
exposed, and further including a chemically active substance adhered to at least one of said  
exposed second portions.

25 6. The stent of claim 5, wherein said substance comprises a pharmacological agent  
or a drug.

7. The stent of claim 6, further including a control device affixed to said tubular  
member, said device being capable of releasing said agent or drug from said at least one  
second portion.

30 8. The stent of claim 7, further including  
an electrically conductive substrate that is configured to be electrically isolated from  
body fluid in contact with said array of microstructures or nanostructures, and

wherein said control device is capable of applying a voltage between said array and said substrate to vary the penetration of the interstices of said array by said fluid, thereby causing release of said agent or drug into said fluid.

5           9.       The stent of claim 1, wherein said array leaves second portions of said surface exposed, and further including

means for electrically isolating said array into separate spatial zones,

at least two of said zones containing chemically active substances adhered to the exposed second portions thereof, and

10           wherein said control device is capable of causing the release of said substances of the separate zones at different times.

10.       The stent of claim 9, wherein said substances are the same chemically active substances of the same or a different dose.

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11.       The stent of claim 9, wherein said substances are different chemically active substances.

12.       The stent of claim 1, further including means for altering the shape of said stent  
20   *in vivo*.

13.       The stent of claim 12, wherein said altering means is capable of changing the diameter of said tubular member.

25           14.       The stent of claim 1, wherein said tubular member has an elongated slot that is coextensive with its length, thereby forming a pair of elongated edges that are movable relative to one another, and the stent further comprising a plurality of electrically controllable structures thereon, the structures capable of moving said edges and releasably latching said edges.

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15.       The stent of claim 1, wherein said tubular member comprises a semiconductor substrate and said array of microstructures or nanostructures is disposed on said substrate.

16. The stent of claim 15, wherein said tubular member further comprises a layer disposed on said substrate, said substrate and said layer having different thermal expansion coefficients.

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17. The stent of claim 16, wherein said microstructures or nanostructures have at least one dimension that is in the range of 4  $\mu\text{m}$  to 20 nm.

18. An implantable stent comprising  
10 a tubular member including a conducting substrate, said member having an interior surface and an exterior surface, characterized in that  
at least one of said surfaces is hydrophobic to a body fluid, and  
a region of said at least one surface includes an array of microstructures or  
nanostructures that covers first portions of said surface, said array rendering the region to have  
15 a dynamically controllable hydrophobicity,  
a medicinal substance adhered to an exposed second portion of said surface, and  
a control device affixed to said tubular member for applying a voltage between said  
fluid and said substrate to vary said hydrophobicity and release said substance into said body  
fluid, said device being actuatable from an *ex vivo* source.

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19. The stent of claim 18, wherein

said exposed second portion is electrically isolated into first and  
second spatial zones, each zone containing a medicinal substance adhered thereto, and  
25 said control device is capable of causing the separate release of said substances from  
the first and second zones.

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20. The stent of claim 19, wherein said substances adhered to said first and second zones are the same substance of the same or a different dose.

21. The stent of claim 19, wherein said substances adhered to said first and second zones are different substances.

22. A method of making an implantable stent comprising the steps of:  
forming a stack that includes a planar conductive substrate of a first material and a  
layer of a second material disposed on said substrate, said materials having different thermal  
expansion coefficients,  
forming on a surface region of said stack an array of microstructures or nanostructures ,  
forming a control device affixed to said stack for dynamically controlling a  
hydrophobicity of said surface region, and  
heating said stack for a predetermined time at a predetermined temperature such that said stack  
rolls into a tubular member.

23. The method of claim 22, wherein said substrate comprises single crystal Si.

24. The method of claim 23, wherein said layer comprises a shaped memory  
material.

25. The method of claim 22, further including, before the heating step, the  
additional steps of:  
providing actuatable means for heating said stack, and  
implanting said stack into a body, and  
actuating the heating means to cause the stack to roll up and form a tubular member.

26. An implantable stent comprising  
a tubular member having an elongated slot that is coextensive with its length, thereby  
forming a pair of elongated edges that are movable relative to one another, and  
means for changing the diameter of said member by moving said edges relative to one  
another.

27. The stent of claim 26, further including means for releasably latching said edges  
after they have been moved.

28. The stent of claim 26, wherein said changing means includes a scratch drive

actuator coupled to said edges.